U.S. Department of Transportation
Office of the Secretary of Transportation

GENERAL COUNSEL

400 Seventh St., S.W.
Washington, D.C. 20590

October 13, 1998

Ms Magalie Roman Salas
Office of the Secretary
Federal Communications Commission
1919 M Street, N.W.
Washington, D.C. 20554

Re: RM 9096
ET Docket No. 98-95

Dear Madame Secretary:

Enclosed please find an original and nine copies of the Reply Comments of the United States Department of Transportation in the above-referenced proceeding.

There is also an additional copy that I request be date-stamped and returned to the messenger.

Respectfully submitted,

Paul Samuel Smith
Senior Trial Attorney

(202) 366-9285

Enclosures

057

ORIGINAL

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of:	)	
	)	
Amendment of Parts 2 and 90 of the	)	
Commission's Rules to Allocate the	)	RM-9096
5.850-5.925 GHz Band to the	)	ET Docket No. 98-95
Mobile Service for Dedicated Short	)	
Range Communications of Intelligent	)	
Transportation Services	)	
	)	

REPLY COMMENTS OF THE UNITED STATES DEPARTMENT OF TRANSPORTATION

Introduction

The Federal Communications Commission ("FCC" or "Commission") in this proceeding has proposed to allocate 75 MHz of spectrum for wireless communications between motor vehicles and roadside systems via Dedicated Short Range Communications ("DSRC") services. Notice of Proposed Rulemaking, released June 11, 1998 ("NPRM"). The United States Department of Transportation ("DOT" or "Department") in its initial comments supported these services as an important component of the National Intelligent Transportation Systems ("ITS") program, which Congress has repeatedly identified as a primary means of improving the nation's transportation infrastructure and enhancing safety, efficiency, and the environment.

Most other participants in this proceeding also urged the FCC to finalize its proposal. *See* Comments of the Association of Public Safety Communications Officials – International, the International Municipal Signal Association, Mark IV Industries, Inc., and PanAmSat Corporation. Some commenters, however, have raised questions that concern the size of the allocation, its location in the 5.9 GHz band, and proposed power limitations. DOT addresses these issues below.

Allocation of 75 MHz

Several parties have suggested that 75 MHz may be more spectrum than is necessary or appropriate. Comments of the American Radio Relay League ("ARRL") at 4-5, 7; Comments of ReSound Corporation ("ReSound") at 8-10; Comments of Motorola at 3. The Department has analyzed spectrum requirements for DSRC purposes, however, and believes that the need for 75 MHz has been amply demonstrated. DOT Comments at 3-5 and note 5. This ARINC analysis is based upon the design of equipment currently available, and it includes as well the higher data rates necessary for additional DSRC applications. DOT determined the number of channels required by careful consideration of the number and type of DSRC applications and the potential density of those applications. The ARINC study concluded that, in the abstract, the number of channels and channel size required less than 75 MHz in the aggregate. Id. However, in order to avoid potential interference from incumbent users in the 5.9 GHz band, an allocation of 75 MHz is necessary as a practical matter. Id.

One such user is the Fixed Satellite Service ("FSS"). On-site analysis shows current FSS uplinks to be approximately 25 MHz wide. These are very high-power sites and many uplinks are directed near the horizon; such factors suggest a potential interference range of several hundred miles. The other primary incumbent is the Department of Defense ("DOD"). DOD radars located in this band could potentially interfere with DSRC systems. This is one of the major reasons that more than the minimum amount of spectrum technically necessary for DSRC operations (in isolation) is appropriate in this case. Without additional spectrum, interference would impede the reliability of DSRC systems, hamper implementation of these systems in affected regions, and restrict development of the full panoply of services now envisioned. DOT Comments at 3-5.

We should also note that although less spectrum has been allocated in Europe and Asia for DSRC purposes, in those regions only very limited applications (like automatic toll collection) have been envisioned. In the United States, DSRC will serve many other functions as well, including many safety related missions. *See* DOT Comments at 2-3; Comments of ITS America at 2, 6-7

Some of the comments directed against the size of the original allocation proposal are based upon potential "competing" uses of the 5.9 GHz band. Motorola and ReSound argue, for example, that their ongoing development of a new hearing-aid device (designed to operate in the band proposed for DSRC) serves an important public interest and warrants an allocation free from interference from DSRC equipment. The Department wholly supports meeting the needs of the hearing impaired. They are also very often drivers and travelers, and hence would reap the benefits of widespread DSRC services. Implementation of those services would suffer unless the Commission allocates the full 75 MHz proposed, for only with this amount of spectrum can there be assurances of national compatibility with primary incumbent users. *See* NPRM at 8-9; DOT Comments at 3-5; Comments of ITS America at 10-14. Thus, there is ample support in the record for the proposed allocation. Any suggestion to the contrary is simply incorrect.

ReSound also claims that DSRC equipment is not taking advantage of technological improvements that would permit smaller per channel (more efficient) usage. Comments of ReSound at 10. DOT defers to manufacturers of DSRC tag devices on this point. [1] To our knowledge, however, they have consistently emphasized that tag cost is the overriding issue in determining the extent of DSRC implementation, and that increased signal processing necessitated by more complex modulation and encoding schemes have the effect of significantly increasing this cost. The Department nonetheless supports efforts to find a more spectrally efficient mechanism, consistent with costs that encourage widespread adoption of DSRC applications. The standards development process now beginning for the 5.9 GHz band is the appropriate forum to generate progress toward such technology. *See* DOT Comments at Attachment 3;

---

[1]/ As noted in our initial comments, DSRC systems consist of vehicle mounted transponders (tags) that communicate with roadside "readers."

Comments of Mark IV Industries at 4-5.[2]

DOT nonetheless encourages ReSound and Motorola to provide us and other interested parties with technical details about their devices. Without this data it is difficult to assess the true impact of DSRC systems on that emerging technology.

The 5.9 GHz Band

The ARRL has expressed concerns about the implications of sharing this band with DSRC services, and has tendered the 40GHz band as appropriate for short-range communications media like DSRC. Comments of ARRL at 5-6. The record clearly establishes, however, that DSRC standards worldwide are converging on 5.9 GHz. DOT Comments at 5; NPRM at 8; Comments of ITS America at 10-14. Thus, the U.S. must remain close to this band in order to foster maximum global interoperability, market access, and public benefit.

The 5.9 GHz band also represents a clear opportunity for spectrum sharing because of the types of users and the nature of DSRC applications. The major primary incumbents, FSS operations and DOD radar, are both sanguine about contemporaneous DSRC use of the band. Comments of PanAmSat; DOT Comments at 5 note 6.

Finally, DOT has begun to work informally with the ARRL to examine the spectrum sharing challenges created by joint use of the band by DSRC and amateur operators. The ARRL has agreed to prepare a recommended band use plan for the 5.9 GHz band in order to provide DOT and others a more detailed understanding of how

---

[2]/ The spectral efficiency of the Motorola/ReSound device under development might also be questioned. It is difficult to accept, as an initial matter, that this ultra-short range, two way communications device apparently requires a full 25 MHz of spectrum. Its proponents have only indicated that this quantity is needed for multiple users in a close environment – say three or four people in an automobile. Comments of ReSound at 3-4. Four users translates to 6.25 MHz of spectrum per user, which is less efficient than the currently suggested DSRC standards. Moreover, although ReSound acknowledges that its device could operate in accordance with Part 15 of the Commission's rules, it reports that development efforts have focused on the 5.850-5.875 GHz band because of the small number of incumbents in that band and for other reasons. Id. at 2 and 7 note 5. In these circumstances, ReSound's opposition to allocations that would generate interference with its device suggests that in effect it actually seeks its own (protected) allocation.

amateur operators tend to use the band. We have in turn allowed AARL a role in compatibility testing of DSRC devices and amateur operations.

Power Output

Two parties have raised a technical issue with respect to power output limits. The Commission proposed that power be limited both in terms of Effective Isotropic Radiated Power ("EIRP") and transmitter output. NPRM at ¶ 8. Amtech and Mark IV Industries recommend that the power be EIRP limited (*i.e.* limited at the antenna) as opposed to limited at the transmitter. Comments of Amtech at 6-7; Comments of Mark IV Industries at 5-6. This is an issue going to the very purposes of DSRC. Limiting transmitter output limits the distance the transmitter can be located from the antenna. For those DSRC applications where the antenna must be located over the roadway, repair and maintenance of antennas subject to the proposed transmitter limits would require closing a lane to traffic. This in turn presents potential safety risks both to the maintenance personnel and to the traveling public. Insofar as a primary goal of DSRC is to reduce the number of obstructions in the roadway in order to maintain safe and efficient highway travel, DOT urges the Commission to adopt the suggestion of these two parties.

Conclusion

The participants in this proceeding have generally supported the allocation of 75 MHz at 5850-5925 MHz for DSRC. Properly so, for the FCC proposal will encourage and accommodate both existing and future DSRC services, to the substantial benefit of the traveling public. The Department has worked with DOD and FSS operators to ensure compatibility with the primary incumbents in this band, and we will continue to work with users to this end as well Power limits should be adopted that further rather than inhibit DSRC purposes. The Department accordingly urges the FCC to finalize its proposed allocation, subject only to a change in the power limitations.

Respectfully submitted,

NANCY E. MCFADDEN
General Counsel

October 13, 1998